

**SYNCHRONOUS BI-DIRECTIONAL DATA TRANSFER  
HAVING INCREASED BANDWIDTH AND SCAN TEST FEATURES**

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**ABSTRACT OF THE DISCLOSURE**

At least one swapper circuit is electrically connected to a bus between a plurality of entities sharing the bus. The swapper comprises a pair of series connected latches and a tristate circuits, one for each data direction, connected in parallel. The swapper acts as a revolving door, capturing data traveling from either side of the bus and shuffling the data to the other side without collision. A latch circuit is connected at either end of the bus for capturing data arriving from the other side. In addition, each of the drive entities is provided with a master/slave latched equipped with scan-in/scan-out ports, respectively, to enable testing of the circuit by allowing internal nodes of the circuit to be observed without requiring an external connection for each node accessed. In a VLSI arrangement, the scan-in/scan-out ports are connected together from a plurality of such circuits such that a variety of test patterns for various hardware configurations may be realized.